

## **Clinical Specimen Selection for Agents of Bioterrorism**

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### **Bacillus anthracis “Anthrax”**

#### **Cutaneous lesions - Vesicular Stage –**

Collect fluid from intact vesicles on sterile swab(s) from previously unopened vesicles. The organism is best demonstrated in this stage.

**Transport – Directly to lab at Room Temperature**

**For transport >1 h and <24 h, transport at 2-8°C**

**Storage - >1 hour at 2-8°C**

#### **Cutaneous lesions - Eschar Stage –**

Collect eschar material by CAREFULLY lifting the eschar's outer edge; insert sterile swab, Then slowly rotate for 2-3 seconds beneath the edge of the eschar without removing it.

**Transport – Directly to lab at Room Temperature**

**For transport >1 h, transport at 2-8°C**

**Storage - >1 hour at 2-8°C**

#### **Stool –**

Collect 5-10 grams in a clean, sterile, leak-proof container. Cary-Blair or equivalent transport Media is acceptable.

**Transport – Unpreserved stool - within 1 hour to laboratory**

**For transport >1 h, transport at 2-8°C**

**Storage – 2-8°C**

#### **Rectal swab –**

For patients unable to pass a specimen, obtain a rectal swab by carefully inserting a swab 1-Inch beyond the anal sphincter.

**Transport – Directly to laboratory at room temperature**

**For transport time >2 h, transport at 4°C**

**Storage – 2-8°C**

#### **Blood –**

Collect per institution's procedure for routine blood cultures

A purple, blue or green-top blood tube may be requested for additional testing.

**Transport – Directly to laboratory at room temperature**

**Storage - Depends on instrument**

#### **Sputum –**

Collect >1 ml expectorated lower respiratory specimen into a sterile, leakproof container.

**Transport – Directly to lab at Room Temperature**

**For transport >1 h and <24 h, transport at 2-8°C**

**Storage - >1 hour at 2-8°C**

#### **CSF, tissue, autopsy samples –**

Collect aseptically and place in sterile container.

**Transport – Directly to laboratory at room temperature.**

#### **Nasal swabs –**

See page 20 of the Level A Manual for Agents of Bioterrorism for information on when and how to collect a nasal swab.

## **Specimen Selection for Agents of Bioterrorism**

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### **Brucella sp. “Brucellosis”**

#### **Serum** –

For serologic diagnosis, an acute phase specimen should be collected as soon as possible after onset of disease. A convalescent phase specimen should be collected >14 days after the acute specimen. At least 1 ml is recommended.

**Transport - ~2 hours at Room Temperature**

**For transport >2 hours, transport at 2-8°C**

**Storage – (-)20°C**

#### **Blood or Bone Marrow** –

These are the sources from which *Brucella* is most often isolated.

Collect per institution's procedure for routine blood cultures

A green, blue or purple-top blood tube may be requested for additional testing.

**Transport - Room Temperature**

**Storage – Depends on instrument**

#### **Spleen, Liver or abscess** –

Collect aseptically and place in sterile container. Tissue must be kept moist, add several Drops of sterile saline if necessary. DO NOT add formalin.

**Transport – 2-8°C**

**Storage - 2-8°C**

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### **Burkholderia spp. “Glanders” and “Melioidosis”**

#### **Blood** –

Collect per institution's procedure for routine blood cultures.

A green, blue or purple-top blood tube may be requested for additional testing.

**Transport - Room Temperature**

**Storage – Depends on instrument**

#### **Serum** –

Use a red top or separator type tube to obtain serum. At least 1 ml of serum should be collected.

**Transport – 2-8°C**

**Storage – 2-8°C; if a several day delay is anticipated, the serum may be frozen**

#### **Urine** –

Collect a midstream clean-catch specimen or a catheterization specimen.

**Transport – 2-8°C**

**Storage – 2-8°C**

## **Specimen Selection for Agents of Bioterrorism**

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### **Burkholderia spp. “Glanders” and “Melioidosis”**

#### **Abscesses, tissue aspirates, fluids –**

Collect tissues and fluids rather than swabs, when possible. Collect aseptically and place in a Sterile container. Tissue must be kept moist, add several drops of sterile saline if necessary. DO NOT add formalin.

**Transport – 2-8°C**

**Storage - 2-8°C**

#### **Special situations –**

Throat, nasal, skin or sputum specimens may be helpful in screening exposed individuals if a release of *B. mallei* or *B. pseudomallei* has been confirmed. If this occurs, please contact the UDOH Laboratory for further instructions.

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### **Clostridium botulinum “Botulism”**

#### **Specimen(s) of choice for confirming botulism:**

- a. Serum (not for infants)
- b. Wound/tissue
- c. Stool and incriminated food

#### **Stool –**

Collect stool and place into a sterile, unbreakable container and label carefully. 10-50 grams (Walnut size) of stool is recommended. In infants, botulism has been confirmed with only “pea-sized” stool samples.

**Transport – 2-8°C**

**Storage – 2-8°C; if a several day delay is anticipated, the stool may be frozen.**

#### **Enema fluid –**

Purge with approximately 20 ml of sterile non-bacteriostatic water to minimize dilution of toxin. Place into a sterile, unbreakable, leakproof container and label carefully.

**Transport -- 2-8°C**

**Storage -- 2-8°C**

#### **Gastric aspirate or vomitus –**

Collect approximately 20 ml in a sterile, leakproof container.

**Transport -- 2-8°C**

**Storage -- 2-8°C**

## **Specimen Selection for Agents of Bioterrorism**

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### **Clostridium botulinum “Botulism”**

#### **Serum** –

Use red top or separator type tubes to obtain serum (no anticoagulant). Samples should be collected as soon as possible after the onset of symptoms and before antitoxin is given. Approximately 20 ml of whole blood should be collected or 10 ml of serum. Serum volumes of less than 3 ml will provide inconclusive results. Serum should be obtained from whole blood prior to transport to the laboratory as it typically undergoes excessive hemolysis during transit. In infants, serum is generally not useful since the toxin is quickly absorbed before the serum can be obtained.

**Transport – 2-8°C**

**Storage – 2-8°C; if a several day delay is anticipated, the serum may be frozen.**

#### **Tissue, wounds or exudates** –

Collect aseptically and place into sterile container. Specimens should be placed in Port-A-Cul Vials and sent to the laboratory.

**Transport – Room Temperature**

**Storage – Room Temperature**

#### **Postmortem** –

Obtain specimens of intestinal contents from different levels of the small and large intestines. Obtain gastric contents as appropriate. Place approximately 10 grams of specimen into a sterile, leakproof container.

**Transport -- 2-8°C**

**Storage -- 2-8°C**

#### **Culture** –

Ship suspicious isolates anaerobically (overlay liquid media with 2-inch layer of sterile petroleum jelly; melt/temper prior to overlaying culture).

**Transport – Room Temperature or Refrigerated**

**Storage – Room Temperature or Refrigerated**

#### **Food Specimens** –

Foods should be left in their original containers if possible, or placed in sterile, leakproof containers. Place containers individually in leakproof containers to prevent cross-contamination during shipment. Empty containers with remnants of suspected foods can be examined. Foods most likely to allow growth of *C. botulinum* will have a pH of 3.5 to 7.0. Possible foods include:

Home canned products having a low acidity (pH of 4.6 or greater)

Foods with low salt or low sugar content

Foods that are held at temperatures which allow the organism to grow (35°C, but as low as 15°C.

Foods that are consumed without prior heating.

Unopened commercially processed cans are to be sent to the U.S. Food and Drug Administration with prior arrangements.

**Transport – Refrigerated**

**Storage – Refrigerated – DO NOT FREEZE**

## **Specimen Selection for Agents of Bioterrorism**

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### **Francisella tularensis “Tularemia”**

#### **Blood –**

Collect per institution’s procedure for routine blood cultures

A blue, purple, or green top tube may be requested for additional testing.

**Transport – Directly to laboratory at room temperature**

**Storage – Room temperature**

#### **Biopsied tissue or scraping/aspirate of ulcer or lesion –**

Collect aseptically and place tissue, scraping or aspirate in a sterile container. For small tissue samples, add several drops of sterile normal saline to keep the tissue moist.

**Transport – Room temperature for immediate processing**

**Storage – If processing is delayed, store at 2-8°C.**

#### **Swabs –**

Obtain a firm sample of the advancing margin of the lesion. If using a swab transport carrier, the swab should be reinserted in the transport package and the swab fabric moistened with the transport medium inside the packet.

**Transport – 2-8°C; Room temperature is acceptable**

**Storage – 2-8°C**

#### **Sputum or aspirate –**

Collect >1 ml of lower respiratory specimen in a sterile, leakproof container.

**Transport -- <2 hours at room temperature**

**For transport >2 hours, transport at 2-8°C**

**Storage – 2-8°C**

#### **Serum –**

For serological diagnosis, an acute phase specimen should be collected as soon as possible after onset of disease. A convalescent phase specimen should be collected 21 days after the acute specimen. Collect blood (a minimum of 5 ml) by venipuncture into a tube without anticoagulant. Allow blood to clot, separate serum into a separate tube.

**Transport – 2-8°C as soon as possible**

**Storage – 2-8°C**

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### **Yersinia pestis “Plague”**

#### **Lower respiratory tract –**

Collect at least 1 ml of a bronchial wash or transtracheal aspirate in a sterile, leakproof container. Sputum may be examined but it is not advised because of contamination by normal throat flora.

**Transport – <2 hours, room temperature**

**If transport time >2 hours, transport at 2-8°C**

**Storage – Store at 2-8°C**

## **Specimen Selection for Agents of Bioterrorism**

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### **Yersinia pestis “Plague”**

#### **Blood –**

Collect per institution’s procedure for routine blood cultures

**Transport – Directly to laboratory at room temperature**

**Storage – Depends on instrument**

#### **Aspirate of involved tissue or biopsied specimen –**

Collect liver, spleen, bone marrow and lung specimens into sterile leakproof containers.

Aspirates may yield little material; therefore, a sterile saline flush may be needed to obtain an adequate amount of specimen. For small tissue samples, add 1-2 drops of sterile normal saline to keep the tissue moist.

**Transport – Room Temperature for immediate processing**

**If processing will be delayed, transport at 2-8°C**

**Storage – 2-8°C**

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### **Vaccinia virus**

#### **Dried vesicular fluid on a slide –**

Collect vesicular fluid by touching a clean glass light-microscope slide to the open lesion multiple times. Let slide air dry for 5 minutes. Place in a slide container for transport.

**Transport – 2-8°C**

**Storage – 2-8°C**

#### **Vesicular swabs –**

Swabs of vesicular fluid should be collected by vigorously scrubbing the base of an unroofed lesion with a sterile swab. A polyester swab is preferred. Contamination with blood is not a concern for this test. Place swab in a snap cap tube or other suitable container. Break off the stick if necessary. Do not add transport fluid.

**Transport – Room Temperature**

**Storage – Room Temperature**

#### **Scabs –**

Aseptically place scrapings/material into a sterile, leakproof, freezable container.

**Transport - ~6 hours at 4°C**

**Storage – (-)20°C to (-)70°C**

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## **Specimen Selection for Agents of Bioterrorism**

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### **Varicella zoster virus “Chickenpox”**

#### **Vesicular swabs –**

Swabs of vesicular fluid should be collected by vigorously scrubbing the base of an unroofed lesion with a sterile swab. A polyester swab is preferred. Contamination with blood is not a concern for this test. Place swab in a snap cap tube or other suitable container. Break off the stick if necessary. Do not add transport fluid.

**Transport – Room Temperature**

**Storage – Room Temperature**

#### **Scabs –**

Aseptically place scrapings/material into a sterile, leakproof, freezable container.

**Transport - ~6 hours at 4°C**

**Storage – (-)20°C to (-)70°C**

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### **Variola virus “Smallpox”**

**A suspected case of smallpox should be reported immediately to the Utah Department of Health for review.**

#### **Biopsy specimens –**

Aseptically place 2 to 4 portions of tissue into a sterile, leakproof, freezable container.

**Transport - ~6 hours at 4°C**

**Storage – (-)20°C to (-)70°C**

#### **Scabs –**

Aseptically place scrapings/material into a sterile, leakproof, freezable container.

**Transport - ~6 hours at 4°C**

**Storage – (-)20°C to (-)70°C**

#### **Vesicular fluid –**

Collect fluid from separate lesions onto separate sterile swabs. Be sure to include cellular material from the base of each respective vesicle.

**Transport - ~6 hours at 4°C**

**Storage – (-)20°C to (-)70°C**

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### **Viral Hemorrhagic Fever (VHF)**

Specific handling conditions are currently under development at the CDC.

#### **Serum** –

Collect 10-12 cc of serum. Laboratory tests used at the CDC to diagnose VHF

Include: antigen-capture ELISA, IgG ELISA, PCR and virus isolation.

**Transport - ~2 hours at room temperature**

**Storage – (-)4°C**